Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Nursing Care of a Patient with Disseminated Tuberculosis Using Gordon's Functional Health Patterns: A Case Report

Biruk Getiso Awata

birukg@wcu.edu.et

Wachemo University

Habtamu Beyene Jeraro

Wachemo University

Bizuayehu Agafari Dukemo

Wachemo University

Case Report

Keywords: disseminated tuberculosis, nursing care process, Gordon's functional health patterns, case report, miliary tuberculosis, nursing diagnosis

Posted Date: June 16th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-10021796/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Abstract

Background: Disseminated tuberculosis (TB) involving multiple organ systems presents significant diagnostic and therapeutic challenges, particularly in resource-limited settings. The nursing care process, structured through Gordon's Functional Health Patterns, provides a comprehensive framework for holistic patient assessment and intervention.

Case Presentation: We report a 21-year-old Ethiopian male with disseminated TB involving the lungs, spine, lymph nodes, and pericardium, complicated by mild anemia. The patient presented with a six-month history of back pain, night sweats, fatigue, and a nine-month history of persistent cough with significant weight loss (62 kg to 54 kg). Despite prior treatment with multiple antibiotics under misdiagnosis, definitive diagnosis was established through imaging (X-ray, CT, MRI, echocardiography) and clinical correlation. The patient was managed with anti-TB therapy (RHZE), pyridoxine, and dexamethasone, alongside a structured nursing care process using Gordon's 11 Functional Health Patterns.

Nursing Process: Seven nursing diagnoses were identified: acute pain, activity intolerance, fear, imbalanced nutrition, deficient knowledge, risk for infection, and risk for impaired gas exchange. Interventions included positioning, medication administration, nutritional support, patient education, psychological support, and infection prevention measures.

Outcomes: Pain alleviation, improved dietary intake, and prevention of respiratory complications were achieved. Activity tolerance and fear reduction were partially met. The patient demonstrated improved disease awareness.

Conclusion: This case demonstrates the critical role of systematic nursing assessment using Gordon's Functional Health Patterns in managing complex disseminated TB. A structured nursing care process significantly contributes to symptom management, patient education, and psychosocial support in multi-system TB.

Introduction

Tuberculosis (TB) remains one of the world's deadliest infectious diseases. According to the World Health Organization, an estimated 10.6 million people fell ill with TB in 2022, with 1.3 million deaths [1]. Disseminated or miliary TB, characterized by hematogenous spread of *Mycobacterium tuberculosis* to multiple organs, accounts for approximately 1–3% of all TB cases and carries significant morbidity and mortality, particularly when diagnosis is delayed [2].

Disseminated TB can involve virtually any organ system, with the lungs, lymph nodes, spine, and pericardium being common sites of extrapulmonary involvement [3]. The clinical presentation is often non-specific, leading to diagnostic delays and misdiagnosis. In Ethiopia, TB remains a major public health concern, with the country ranking among the 30 high-burden TB countries globally [4].

The nursing care process provides a systematic framework for delivering patient-centered care. Gordon's Functional Health Patterns, first introduced in 1982, offer a holistic assessment approach that examines 11 areas of human function, enabling nurses to identify patient problems across biological, psychological, and social dimensions [5]. This framework has been widely adopted in nursing education and practice for its comprehensiveness and clinical utility.

Recent evidence demonstrates that structured nursing interventions significantly improve treatment compliance, psychological outcomes, and patient satisfaction in TB care. A 2024 systematic review and meta-analysis found that nursing care interventions significantly improved medication adherence (OR = 3.601), reduced anxiety (SMD = −2.728) and depression (SMD = −1.389), and lowered the incidence of adverse drug reactions (OR = 0.259) among pulmonary TB patients [6]. These findings underscore the critical role of nursing in TB management.

This case report describes the nursing care process for a young male with disseminated TB involving multiple organ systems, assessed, and managed using Gordon's 11 Functional Health Patterns. The report aims to illustrate the application of systematic nursing assessment and intervention in complex TB cases and contribute to the limited body of nursing literature on disseminated TB care.

Literature Review

Epidemiology and Pathophysiology of Disseminated Tuberculosis

Disseminated TB results from hematogenous spread of *M. tuberculosis* following reactivation of a latent focus or primary infection. It predominantly affects immunocompromised individuals, though cases in immunocompetent hosts are increasingly recognized [7]. William et al. (2024) reported a case of disseminated TB in an immunocompetent 40-year-old female involving the lungs and central nervous system, highlighting that immunocompetence does not preclude widespread dissemination [7].

The pathophysiology involves bacillemia leading to seeding of multiple organs. In the lungs, miliary pattern manifests as diffuse 1–2 mm nodules resembling millet seeds on radiography. Spinal involvement (Pott's disease) occurs through hematogenous spread to vertebral bodies, potentially causing vertebral collapse and neurological deficits. Lymphatic dissemination results in tuberculous lymphadenitis, while pericardial involvement can lead to constrictive pericarditis or cardiac tamponade [8].

Diagnostic Challenges

Diagnosing disseminated TB requires high clinical suspicion and a multi-pronged approach. Sputum acid-fast bacilli (AFB) smear may be negative, as in this case, necessitating reliance on imaging and molecular diagnostics [8]. Chest radiography typically shows miliary mottling, while CT and MRI provide superior characterization of extrapulmonary involvement. A recent case report emphasized that TB

dissemination can present with atypical complaints, with the only indication being miliary pattern on chest X-ray [9].

Nursing Assessment Frameworks

Gordon's Functional Health Patterns provide a structured approach to holistic patient assessment. The 11 patterns—health perception-health management, nutritional-metabolic, elimination, activity-exercise, sleep-rest, cognitive-perceptual, self-perception-self-concept, role-relationship, coping-stress tolerance, sexuality-reproductive, and value-belief—enable comprehensive data collection that informs nursing diagnosis and care planning [5]. This framework aligns with NANDA-I nursing diagnoses and supports evidence-based practice [10].

Nursing Interventions in Tuberculosis Care

Contemporary evidence strongly supports the effectiveness of nursing interventions in TB management. A 2024 meta-analysis of 16 studies demonstrated that nursing care interventions significantly improved treatment compliance, psychological function, social function, and patient satisfaction while reducing anxiety, depression, and adverse drug reactions [6]. Key intervention components include structured education, psychological support, regular monitoring, and energy conservation strategies [6].

Nutritional support is particularly critical in TB care. The WHO emphasizes that malnutrition is both a risk factor for and consequence of TB, with protein-energy malnutrition impairing immune function and treatment response [11]. Nursing interventions targeting nutritional rehabilitation—including protein and iron supplementation—are essential components of comprehensive TB care [12].

Psychosocial support represents another critical nursing domain. Maynard et al. (2023) conducted a mixed-methods systematic review demonstrating that psychosocial interventions significantly improve mental health outcomes and treatment adherence in TB patients [13]. Fear, anxiety, and depression are common psychological responses to TB diagnosis and prolonged treatment, necessitating integrated psychological nursing care [13].

Infection prevention remains fundamental in nursing management of TB. Nurses play a pivotal role in implementing airborne precautions, educating patients on cough etiquette, and monitoring for treatment-related adverse effects [14]. The National Tuberculosis Nurse Coalition (2024) core competencies emphasize screening, diagnostic test interpretation, treatment monitoring, and recognition of medication side effects as essential nursing skills [15].

For patients with spinal TB, nursing care must address pain management, activity limitations, and prevention of neurological complications. Positioning, analgesic administration, and gradual mobilization are key nursing interventions [16]. Energy conservation techniques and activity pacing help manage the fatigue and dyspnea associated with pulmonary involvement [17].

Case Presentation

Patient Information

A 21-year-old Ethiopian male from Hawassa presented to the medical ward with a six-month history of progressive back pain, night sweats, and easy fatigability. He reported a nine-month history of persistent cough, poor appetite for six months, and unspecified weight loss over the preceding three months. The patient was referred from a private health facility where disseminated TB had been diagnosed.

History of Present Illness

The patient described dull aching back pain originating in the thoracic region and radiating to the lower back. Pain was aggravated by cough and physical activity, and relieved by rest. He denied histories of diabetes mellitus, bronchial asthma, or hypertension.

Past Medical History

Eight months prior, he was treated for community-acquired pneumonia with antibiotics and analgesics. Six months prior, he had a supraclavicular abscess that healed with scarring.

Family and Social History

The patient is the eldest son in a family of seven children. His father died two years prior from TB with unspecified comorbidities while on anti-TB medication. Following his father's death, the patient assumed full family responsibility, discontinuing his education at Grade 8 to support his family through small-scale commerce (selling tea and bread). He has no history of cigarette smoking, alcohol consumption, or substance use. He is a member of an edir (traditional community-based mutual support association) and actively participates in social activities.

Initial Clinical Assessment

General Appearance: Uncomfortable, acutely ill-looking, but well-groomed.

Vital Signs:

- Axillary temperature: 36.7°C
- Respiratory rate: 24 breaths/min (diaphragmatic, shallow, regular)
- SpO_2: 95% on room air
- Pulse: Apical 80 bpm; Radial 78 bpm (irregular, bounding)
- Blood pressure: Sitting—Left 90/63 mmHg, Right 89/51 mmHg; Supine—Left 98/53 mmHg, Right 103/61 mmHg
- Weight: 54 kg; Height: 1.62 m; BMI: 20.44 kg/m²

Physical Examination Findings:

- Skin: Lesion-free, cold, moist, smooth; poor skin turgor
- Hair: Smooth, evenly distributed, gray-colored
- Oral cavity: Intact, pink, moist mucosa and tongue
- Nails: Pink, convex, non-clubbed
- Abdomen: Rounded, inverted umbilicus, no distension, no organomegaly
- Bowel sounds: Present every 8 minutes
- Chest: Symmetrical, increased anterior-posterior diameter (pigeon chest), mild rales bilaterally
- Cardiovascular: S1 and S2 audible, no murmurs; regular carotid pulses; capillary refill <2 seconds; pale conjunctivae

Supporting investigations and imaging results in detail are presented below in table 1 as follows.

Table 1: Investigations and Imaging Results description

Investigation	Finding
Chest X-ray	Diffuse 1–2 mm miliary opacities throughout all lung fields
CT Scan	Disseminated TB to spine, lung, pericarditis, and lymph nodes; large pre- and paravertebral abscess collections
Echocardiography	Minimal pericardial effusion
MRI	Cervical and thoracic pre- and paravertebral long-segment collections with internal air-fluid levels, peripheral thick double wall, hematogenous marrow signal intensity, and contrast enhancement of vertebral bodies
AFB Smear	Negative
Hematology	
WBC	11.8 × 10^9/L
Hemoglobin	11.6 g/dL (mild anemia)
Hematocrit	32.2%
ESR	50 mm/hr
Neutrophils	68.5 × 10^9/L
Platelets	544,000/µL
Biochemistry	
Sodium	134 mEq/L
Potassium	3.95 mEq/L
Chloride	94.4 mEq/L
SGOT	10.5 U/L
ALP	69 IU/L
Creatinine	0.9 mg/dL
BUN	24 mg/dL
PT/PTT/INR	12 sec / 27 sec / 1.0

Medical Management

The patient was commenced on:

- Anti-TB therapy (RHZE): 4 tablets orally daily
- Pyridoxine: 50 mg orally daily
- Dexamethasone: 8 mg intravenously QID

Nursing Care Process Using Gordon's Functional Health Patterns

1. Health Perception–Health Management Pattern

Subjective Data: The patient verbalized admission for worsening back pain, night sweats, and fatigue. He defined health as living and working in peace and sleeping peacefully ("[illegible]"). He had no history of health maintenance practices beyond activities of daily living. He reported childhood immunizations but could not recall specifics. He had self-medicated with paracetamol for headaches and amoxicillin for cough. No known drug, food, or environmental allergies.

Objective Data: Uncomfortable, acutely sick appearance; well-groomed. Vital signs as documented. Irregular bounding radial pulse.

Nursing Considerations: The patient's health perception is culturally embedded, emphasizing peace and functionality. His self-medication history and delayed presentation reflect limited health literacy and access to appropriate care. The father's death from TB while on treatment may influence his health beliefs and fears regarding prognosis.

2. Nutritional–Metabolic Pattern

Subjective Data: Fluid intake reduced to approximately two glasses of water daily. Dietary preferences included tomato stew with injera, vegetables with injera, and bread with tea. History of poor appetite for six months. Three meals daily habitually. Self-reported weight loss from 62 kg (two weeks prior) to 54 kg at admission. History of heartburn.

Objective Data: BMI 20.44 kg/m² (low-normal, but representing 12.9% weight loss). No jaundice, pallor, cyanosis, or erythema. Skin cold, moist, smooth with poor turgor (pinch returns slowly). No edema. Hair smooth, evenly distributed, gray. Oral mucosa intact, pink, moist. Nails pink, convex, non-clubbed.

Nursing Considerations: The patient demonstrates significant weight loss (12.9% of body weight) consistent with chronic disease and poor nutritional intake. Poor skin turgor indicates dehydration. The combination of TB, anemia (Hb 11.6 g/dL), and inadequate protein intake places him at high risk for further nutritional deterioration.

3. Elimination Pattern

Subjective Data: Bowel movements twice daily; stool color mostly gray; amount decreased. No pain during defecation, constipation, diarrhea, or laxative use. No history of bowel surgery. Urine yellowish; no reduced output; no history of catheterization or elimination disorders.

Objective Data: Abdomen rounded, inverted umbilicus, no distension. No masses or tenderness. Bowel sounds heard every 8 minutes. No organomegaly. No shifting dullness. No penile inflammation, drainage, or discharge.

Nursing Considerations: Elimination patterns are largely within normal limits. Gray-colored stool may relate to dietary factors or mild hepatic involvement; monitoring during anti-TB therapy is essential given hepatotoxic potential of the regimen.

4. Activity–Exercise Pattern

Subjective Data: Difficulty with daily living activities; dyspnea with cough; easy fatigability; dyspnea even with minor activities; periodic back pain radiating to left shoulder and lower back, aggravated by activity and cough.

Objective Data: Level of dependence score: 3 (requires intensive intervention). Musculoskeletal examination: balanced gait, symmetrical lower extremities, well-erect posture, full active range of motion in all joints, normal muscle tone. Respiratory: pigeon chest configuration, symmetrical chest, dyspnea during activity, relaxed intercostal spaces, equal tactile fremitus, mild rales bilaterally, resonant percussion. Cardiovascular findings as previously documented.

Nursing Considerations: Activity intolerance is multifactorial, stemming from pulmonary involvement (reduced gas exchange), spinal disease (pain and potential neurological compromise), anemia (reduced oxygen-carrying capacity), and chronic illness deconditioning. The level of dependence score of 3 indicates significant functional impairment requiring intensive nursing support.

5. Sleep–Rest Pattern

Subjective Data: Sleep disturbance due to back pain and night sweats for six months. Inadequate sleep (approximately 4 hours/day). Difficulty falling asleep due to fear of back pain. Identified that absence of pain and cough facilitates sleep, while pain and sweating hinder it.

Objective Data: Yawning infrequently (twice per 30 minutes). Not irritable.

Nursing Considerations: Chronic sleep deprivation (<5 hours/night) exacerbates pain perception, impairs immune function, and reduces coping capacity. Pain and night sweats are classic TB symptoms that significantly disrupt sleep architecture. Sleep hygiene interventions and pain management are priorities.

6. Cognitive–Perceptual Pattern

Subjective Data: Educated to Grade 8; literate (can read and write). Primary language: Sidamegna; also speaks Amharic. No visual or hearing impairment. Self-reported intact smell, taste, touch, and memory.

Objective Data: Visual fields intact. Good short-term and long-term memory. Appropriate speech and articulation. Well-oriented to person, place, and time. Intact tympanic membranes. Intact sensation to hot/cold, deep/superficial pressure, and pain.

Nursing Considerations: Cognitive function is preserved, facilitating patient education and shared decision-making. Health education should be provided in Sidamegna where possible to ensure

comprehension. Literacy enables use of written educational materials.

7. Self-Perception–Self-Concept Pattern

Subjective Data: Expressed hope for health restoration and return to work, with faith in God and healthcare providers. Stated that except for his health condition, he can perform all previous activities.

Objective Data: Well-dressed and clean. Nervous when comparing past and current status. Appropriate tone of voice and well-oriented during conversation.

Nursing Considerations: The patient maintains positive self-concept and hope, which are protective psychological factors. However, the contrast between his previous role as family provider and current dependent status may threaten self-esteem. Body image concerns may emerge with continued weight loss and visible illness.

8. Role–Relationship Pattern

Subjective Data: Primary family supporter and merchant. Member of edir and various social groups. Previously satisfied with life; currently dissatisfied with health status. Lives with family. Illness directly affects activities of daily living. No family history of diabetes, hypertension, asthma, or cancer.

Objective Data: Excellent interaction with family members. Good communication with attendants and healthcare providers. Frequent visitors with high social support.

Nursing Considerations: Strong family and social support systems are protective factors. However, the role reversal from provider to patient may cause psychological distress. His withdrawal from school to assume family responsibility reflects significant sacrifice and potential for resentment or grief.

9. Coping–Stress Tolerance Pattern

Subjective Data: Identified worsening back pain and night sweats as primary stressors. Coping mechanisms include prayer and seeking hospital care. Identified family and healthcare providers as most helpful supports.

Objective Data: No observed religious prayer support by priests in the preceding two weeks. Nurse provided education on continuing institutional care in a manner non-contradictory to religious practices.

Nursing Considerations: The patient utilizes faith-based coping, which is culturally appropriate and potentially beneficial. Integration of spiritual care with medical treatment should be encouraged. The absence of clergy visits may indicate need for spiritual care referral.

10. Sexuality–Reproductive Pattern

Subjective Data: No history of testicular self-examination. No history of modern contraceptive use. No sexual dysfunction.

Objective Data: No testicular masses or swelling. No penile masses or lesions.

Nursing Considerations: As a young adult male, reproductive health counseling should be addressed, including potential effects of TB and its treatment on fertility, and the importance of testicular self-examination.

11. Value–Belief Pattern

Subjective Data: History of participation in cultural and traditional practices. Interest in contacting religious leaders for prayers.

Objective Data: Bible present at bedside. No observed Bible reading, prayer, or clergy visits during nursing observation.

Nursing Considerations: The patient's Protestant faith is an important cultural and spiritual resource. Nurses should facilitate spiritual practices as desired and ensure care is culturally sensitive and respectful of traditional beliefs.

Nursing Diagnoses, Planning, Implementation, and Evaluation

Based on the comprehensive assessment using Gordon's Functional Health Patterns, the following nursing diagnoses were identified using NANDA-I taxonomy [10]:

Nursing Diagnosis 1: Acute Pain

Related to: Nerve involvement due to tuberculosis dissemination to the spine
Evidence: Patient verbalization of back pain

Goal: To reduce pain
Expected Outcome: Patient will verbalize reduced back pain within 48 hours

Interventions:

- Position patient in comfortable positions with frequent position changes
- Administer prescribed analgesics and anti-TB medications appropriately
- Provide calm environment through therapeutic communication
- Teach non-pharmacological pain management techniques

Implementation: Patient positioned comfortably with frequent changes. Prescribed medications administered. Calm environment maintained through two-way communication.

Evaluation: Pain alleviated — **Met**

Nursing Diagnosis 2: Activity Intolerance

Related to: Episodes of back pain and anemia
Evidence: Easily fatigability, dyspnea with minor activities

Goal: To facilitate participation in recommended activities of daily living
Expected Outcome: Patient will participate in activities that reduce cardiac workload within 72 hours

Interventions:

- Teach energy conservation methods
- Encourage gradual participation in self-care
- Assist with activities of daily living as needed
- Monitor vital signs during activity

Implementation: Energy conservation techniques taught. Self-care participation encouraged.

Evaluation: Patient slightly trying to participate in recommended ADLs — **Partially Met**

Nursing Diagnosis 3: Fear

Related to: Prolonged treatment in different health setups and disease prognosis
Evidence: Patient expression of anxiety regarding condition

Goal: To reduce fear and anxiety
Expected Outcome: Patient will verbalize reduced fear and adequate sleep within 2 days

Interventions:

- Provide positive self-image conversation and present prognosis
- Advise rest and stress reduction techniques
- Provide calm environment through two-way communication
- Address misconceptions about TB treatment

Implementation: Frequent advice provided on rest and forgetting stressful situations. Positive conversations about prognosis conducted.

Evaluation: Fear reduced — **Partially Met**

Nursing Diagnosis 4: Imbalanced Nutrition: Less Than Body Requirements

Related to: Poor appetite and hypermetabolic state of TB
Evidence: 12.9% weight loss, poor muscle tone, mild anemia (Hb 11.6 g/dL)

Goal: To improve dietary intake and nutritional status
Expected Outcome: Patient will verbalize improved dietary intake within 3 days

Interventions:

- Enhance protein-rich diet intake to address muscle wasting and support anti-TB medication tolerance
- Enhance iron-rich diet intake for mild anemia
- Monitor daily weight and intake/output
- Collaborate with nutritionist for dietary planning

Implementation: Protein and iron-rich diet intake enhanced. Rationale explained regarding TB medication effects on muscle and need for nutritional rehabilitation.

Evaluation: Dietary intake habit improved — **Met**

Nursing Diagnosis 5: Deficient Knowledge

Related to: Unfamiliarity with disease information resources
Evidence: Request for information, history of self-medication, misdiagnosis for over a year

Goal: To create awareness of disease condition, treatment, and prevention
Expected Outcome: Patient will verbalize adequate awareness within 24 hours

Interventions:

- Educate on TB risk factors and preventive measures for communicable diseases
- Explain treatment regimen, duration, and importance of adherence
- Discuss prognosis and expected outcomes
- Provide information on health maintenance practices

Implementation: Education provided on TB risk factors, preventive measures, treatment options, and health maintenance.

Evaluation: Awareness concerning basic knowledge created — **Met**

Nursing Diagnosis 6: Risk for Infection

Related to: Poor primary defenses and malnutrition
Evidence: Immunocompromised state, chronic disease, hospitalization

Goal: To prevent secondary infections
Expected Outcome: Patient will verbalize absence of signs of infection within 7 days

Interventions:

- Teach early warning signs of infection

- Maintain well-ventilated room environment
- Monitor vital signs appropriately
- Follow infection prevention protocols

Implementation: Room kept well-ventilated. Vital signs monitored. Early warning signs of infection taught.

Evaluation: Infection prevented — **Met**

Nursing Diagnosis 7: Risk for Impaired Gas Exchange

Related to: Destruction of alveolar-capillary membrane from miliary TB
Evidence: Bilateral lung involvement, mild rales, tachypnea (24/min)

Goal: To prevent respiratory complications
Expected Outcome: Patient will maintain adequate oxygenation

Interventions:

- Monitor respiratory rate, rhythm, and depth
- Monitor SpO_2 levels
- Position for optimal lung expansion
- Encourage coughing and deep breathing exercises

Implementation: Respiratory status monitored. Positioning optimized.

Evaluation: Respiratory complications prevented — **Met**

Discussion

This case illustrates the complexity of nursing care for disseminated TB involving multiple organ systems. The application of Gordon's Functional Health Patterns enabled comprehensive assessment across all dimensions of patient function, facilitating identification of seven distinct nursing diagnoses that addressed physical, psychological, and social needs.

The patient's presentation with disseminated TB—involving lungs, spine, lymph nodes, and pericardium—is consistent with the hematogenous spread pattern described in the literature. The negative AFB smear, despite extensive disease, is not uncommon in miliary TB and underscores the importance of imaging in diagnosis [8]. The 12.9% weight loss, mild anemia, and elevated inflammatory markers (ESR 50 mm/hr) reflect the chronic inflammatory state and nutritional compromise typical of advanced TB [11].

The nursing care process demonstrated several evidence-based practices. Nutritional interventions targeting protein and iron supplementation align with WHO recommendations for TB nutritional care and

recent evidence demonstrating that nursing interventions improve nutritional outcomes [11, 12]. The emphasis on patient education addresses the documented knowledge deficit and supports treatment adherence, a critical factor given that structured nursing education significantly improves medication compliance (OR = 3.601) [6].

Psychological nursing care addressed the patient's fear and stress, consistent with meta-analytic evidence showing that nursing interventions significantly reduce anxiety (SMD = − 2.728) and depression (SMD = − 1.389) in TB patients [6]. The integration of spiritual and cultural considerations—respecting the patient's faith and traditional practices—reflects holistic nursing principles and culturally competent care [5].

The partially met outcomes for activity tolerance and fear reduction highlight the chronic nature of these issues in disseminated TB. Activity intolerance in spinal TB requires prolonged rehabilitation, while fear may persist throughout the lengthy treatment course. These findings align with literature on post-TB health and wellbeing, which documents persistent physical and psychological sequelae even after microbiological cure [18].

Several limitations should be acknowledged. This single-case report limits generalizability. The nursing care was provided in a single institution without long-term follow-up data. The partially met outcomes suggest areas for intervention refinement, potentially including more structured physiotherapy for activity intolerance and formal psychological counseling for fear reduction.

Conclusion

This case report demonstrates the successful application of Gordon's Functional Health Patterns in structuring comprehensive nursing care for a patient with disseminated tuberculosis involving multiple organ systems. The systematic assessment framework enabled identification of diverse patient needs across biological, psychological, and social domains. Evidence-based nursing interventions addressing pain, nutrition, activity, knowledge, infection prevention, and psychosocial support contributed to positive patient outcomes.

The findings support the broader evidence base demonstrating that structured nursing care significantly improves treatment compliance, psychological outcomes, and patient satisfaction in tuberculosis management. For patients with complex disseminated TB, the nursing care process is not merely supportive but integral to holistic patient recovery. Future research should examine the long-term outcomes of nursing care in disseminated TB and develop standardized nursing protocols for multi-system TB management.

Declarations

Patient Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying information. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Ethics Approval and Consent to Participate: Not applicable (case report with patient consent).

Consent for Publication: Written informed consent obtained from the patient.

Availability of Data and Materials: All data generated or analyzed during this study are included in this published article.

Competing Interests: The author declares no competing interests.

Funding: No funding was received for this case report.

Author Contributions: Biruk Getiso conducted the nursing assessment, developed the care plan, implemented interventions, and drafted the manuscript.

Acknowledgements: The author acknowledges the patient and his family for their cooperation and the healthcare team at the medical ward for their collaborative care.

References

1. World Health Organization. Global Tuberculosis Report 2023. Geneva: WHO; 2023.
2. Sharma SK, Mohan A, Sharma A, Mitra DK. Miliary tuberculosis: new insights into an old disease. Lancet Infect Dis. 2005;5(7):415-430.
3. Mehta PK, Raj A, Singh N, Khuller GK. Diagnosis of extrapulmonary tuberculosis by PCR. FEMS Immunol Med Microbiol. 2012;66(1):20-36.
4. Federal Democratic Republic of Ethiopia Ministry of Health. National Guidelines for the Management of Tuberculosis. 4th ed. Addis Ababa: MOH; 2021.
5. Gordon M. Manual of Nursing Diagnosis. 14th ed. Burlington: Jones & Bartlett Learning; 2019.
6. Agbeko CK, Mallah MA, He B, Liu Q, Song H, Wang J. Effectiveness of nursing care intervention for patients with pulmonary tuberculosis: a systematic review and meta-analysis. J Clin Nurs. 2024;33(15):e1-e15. doi:10.1111/jocn.17123
7. William Y, Herwanto V, Octavius GS. Disseminated tuberculosis in an immunocompetent young female: a case report from Indonesia and a literature review. Egypt J Radiol Nucl Med. 2024;55:242. doi:10.1186/s43055-024-01407-8
8. StatPearls. Miliary Tuberculosis: Treatment & Management. Treasure Island: StatPearls Publishing; 2024.
9. A Case Report of Widely Disseminated Tuberculosis in an Immunocompetent Male. Cureus. 2020;12(6):e8454. doi:10.7759/cureus.8454

10. INKA (formerly NANDA International). NANDA-I Nursing Diagnoses: Definitions and Classification 2024–2026. New York: Thieme; 2024.
11. World Health Organization. Guideline: Nutritional Care and Support for Patients with Tuberculosis. Geneva: WHO; 2013.
12. NurseTogether. Tuberculosis: Nursing Diagnoses, Care Plans, Assessment & Interventions. 2023. Available from: https://www.nursetogether.com/tuberculosis-nursing-diagnosis-care-plan/
13. Maynard C, Tariq S, Sotgiu G, Migliori GB, van den Boom M, Field N. Psychosocial support interventions to improve treatment outcomes for people living with tuberculosis: a mixed methods systematic review and meta-analysis. EClinicalMedicine. 2023;61:102057. doi:10.1016/j.eclinm.2023.102057
14. NursesLabs. 6 Pulmonary Tuberculosis Nursing Care Plans. 2024. Available from: https://nurseslabs.com/pulmonary-tuberculosis-nursing-care-plans/
15. National Tuberculosis Nurse Coalition. TB Nurse Case Management Core Competencies. 2024. Available from: https://centerfortuberculosis.mayo.edu/
16. Guimarães TMR, Amorim CT, Barbosa EFF, et al. Nursing care to a patient having pulmonary tuberculosis disease and comorbidities: case report. Rev Fund Care Online. 2018;10(3):683-689. doi:10.9789/2175-5361.2018.v10i3.683-689
17. van Aswegen H, Roos R. Physical impairments and activity limitations experienced by people with tuberculosis: a scoping review protocol. JBI Database System Rev Implement Rep. 2017;15(1):49-54.
18. Nightingale R, Carlin F, Meghji J, et al. post-TB health and wellbeing. Int J Tuberc Lung Dis. 2023;27(4):248-283. doi:10.5588/ijtld.22.0514

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- PATIENTCONSENTFORPUBLICATION.docx